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THE NONVERBAL COMMUNICATION OF APHASICS IN CONVERSATION

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APHASIA AND SPOKEN INTERACTION

"Aphasia and Spoken Interaction" is a research project at the Department of Linguistics, University of Göteborg, Sweden. The project is financed by the HSFR (The Swedish Humanities and Social Sciences Research Council). The project is interdisciplinary and involves linguists, speech pathologists and a neurologist. The persons involved are Jens Allwood, Elisabeth Ahlsén, Stina Linell and Peter Borenstein. The purpose of the project is to investigate some factors which have so far received rather scant attention in the study of the linguistic communication of aphasics. The project is primarily concerned with semantic operations in speech production and speech comprehension. The linguistic data are taken from both conversational settings and test situations since there is good reason to believe that semantic as well as other aspects of linguistic performance show a great deal of situational variation. Special attention is also given to conversational strategies, including nonverbal, i.e. bodily signals.

Göteborg 1984-11-19

Jens Allwood
project leader

Previous reports from the project:

Allwood J. & Ahlsén E. 1984: Semantik och afasi. *Gothenburg Papers in Theoretical Linguistics* S5.

The reports can be ordered from the Department of Linguistics, University of Göteborg, Box 200, SE-405 30 Göteborg

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1. INTRODUCTION

Nonverbal communication in aphasics has been studied very little (cf. Cicone et al 1979, Feyreisen & Seron 1982a). It is an area of both theoretical and practical/therapeutic interest, especially with respect to the question of whether nonverbal communication (NVC) can be used by aphasics as compensation for verbal communication. The aim of this study is to describe NVC in some aphasics with different symptoms with this question in mind .

Part 1 is a quantitative study of NVC, i.e. it describes the amount of NVC used by aphasics in videotaped conversations. Comparisons are made between the amount of NVC in verbally problematic and verbally unproblematic utterances and between the amount of NVC used by aphasics and by their conversation partners (all speech therapists).

Part 2 is a qualitative description of the NVC used in the same conversations, i.e. occurrences of NVC are described in terms of possible type or function. The ability to use NVC in a formal test is compared with the use of NVC in conversation. The different aphasics are also compared and aphasics are compared to nonaphasics (the therapists) in order to find out if there are any differences that might be of interest.

2. BACKGROUND

2.1. The content of nonverbal communication

The content of nonverbal communication (such as gestures, facial expressions etc.) can in general be thought of as including one or more of the following:

1) giving information about physiological condition
2) giving information about feelings and attitudes
3) regulating communication (turntaking and feedback)
4) structuring and supplementing information (emphasis, clarification, illustration, focus, negation, etc.)

All these possibilities are taken into account in this study. Nonverbal communication of all these kinds may be used with low or high degrees of communicative awareness (Allwood 1978).

2.2. Theories about aphasia and nonverbal communication

Different theories have different consequences for the expectation of finding more or less NVC in aphasics.

Some theories predict similar disturbances, of verbal and nonverbal communication:

One theoretical standpoint has been to see aphasia as a central disturbance of the ability to use "symbols". This would affect both verbal and nonverbal communication, probably to equal extents. This view, emanating from the holistic tradition in aphasiology (e.g. Marie 1906), has not found much support In recent studies (cf.Goodglass & Kaplan 1963, Picket 1974 and Davis et al 1979).

A common disturbance of output of complex motor sequences has also been hypothesized in aphasia (Kimura 1976). This would leave the motor sequences of speech and gesture equally disturbed.

The theory that speech in the form of "inner speech" regulates all motor behaviour (Vygotsky 1978, Luria 1976) also suggests that one would find a common disturbance in speech and nonverbal communication.

Other theories suggest nonverbal communication as a possible substitution for verbal communication:

The hypothesis that NVC might be used by aphasics as substitution or compensation for verbal expression was first mentioned by Bouillaud in 1825. Recent findings suggest that this might be true for Broca's aphasics (Rogers 1979, Feyreisen et al 1982) and especially with regard to gestures with a symbolic function, i.e. emblems (NVC

with a conventional meaning, used Instead of words, e.g. waving one's hand for "good-bye") or illustrators (NVC used to illustrate what is said, e.g. pointing in a circle when uttering "round") (cf. Ekman & Friesen 1969). In a study by Cicone et al (1979) this was affirmed for aphasics with frontal brain damage, while those with posterior brain damage used many complex gestures with unclear messages. According to the authors there was no clear tendency for aphasics as a group to use NVC as spontaneous compensation.

Some theories separate functions of communication:

It has been assumed that NVC used for functions such as regulating social interaction" or "communicating state of feeling should be less disturbed in aphasics, than NVC used for communication of ideas or propositions. This would probably be applicable to verbal communication as well, but from an "evolutionary perspective" (cf. Jackson 1931) NVC might be relatively more important in "interactional" and "emotional" functions, since they ought to have been developed earlier than verbal communication.

Turntaking mechanisms, many of which can be nonverbal, have been assumed to be preserved in aphasics (Feyreisen et al 1982b). The same functions would be intact as in normals (cf. Duncan & Fiske 1977). This assumption has, however, not been tested. The same kind of assumption could be made for feedback mechanisms, i.e. signals used by the speaker to elicit reactions from the listener and by the listener to show how he is reacting to the speaker. These signals can be verbal, but are also often nonverbal and could consequently be expected to be better preserved than speech per se in aphasics.

There are also theories about NVC and semantic planning:

The observation that NVC is used for structuring verbal production, I.e. for semantic planning (Kendon 1972, 1975, Butterworth & Beattie 1978) and the finding that this could be seen in Wernicke's aphasics, in that the amount of gesturing increased when they had problems with semantic planning (Delis et al 1979) is also highly relevant for the interpretation of NVC in aphasics.

The last three kinds of theories mentioned above are easily compatible, while a strong version of a theory about similar disturbances of verbal and nonverbal communication would not be fully compatible with them.

3. POINT OF DEPARTURE

Seen against this background, the main questions examined in this study are:

1) Is NVC generally used more in situations where speech is problematic than in other situations?

2) Is NVC used more by aphasics than by normal speakers?

3) What types or functions of NVC are found in aphasics of different types a) generally, b) in situations with verbal problems?

4) How is the ability of aphasics to use NVC in conversation related to their ability to use NVC in a test situation?

5) Is NVC used as compensation for verbal communication by aphasics of different types?

Only tentative answers can be given to these questions, since the study is based on only five patients.

The term "NVC is used in this study to cover all kinds of body, limb or head movements as well as "salient" facial expressions.

4. METHOD

4.1. Subjects

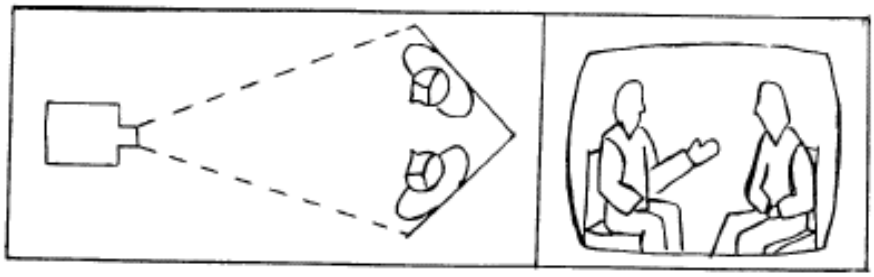
Five aphasics, clinically defined using the Reinvang aphasia test battery (Reinvang & Engvik 1980), and their therapists were used as subjects. Patients 1 (conduction aphasic with anomia) and 4 (Wernicke's aphasic with anomia) were both fluent speakers. Patients 2 (conduction aphasic with severe anomia), 3 (Broca's aphasic with anomia and speech production problems) and 5 (Broca's aphasic with severe anomia) were non-fluent speakers. (Aphasia types specified in Appendix l.) All the aphasics were hemiplegic, i.e. they could not move their right arm and leg, or they could only move them a little with great effort.

4.2. Procedure

Each aphasic was videotaped in a ten minute conversation with his/her therapist. The topics discussed were the patient's illness, how the patient spends a day, the patient's occupation and travelling. The videorecording was made with one camera. The subjects were seated at right angles to one another and visible to the camera except for their lower legs (see figs. 1 and 2)

The conversations were transcribed, including verbal and nonverbal communication, by two independent transcribers and the reliability of the transcriptions was confirmed.

Figs. 1 & 2.



4.3. Part 1 - Quantitative analysis

In order to obtain a simple quantitative measure of NVC in different contexts, the following utterances of one or two sentences were extracted from transcriptions with only verbal content:

For each patient and each therapist:

the first six verbally problematic utterances
the first six verbally unproblematic utterances.

Utterances which were attempts to explain something in a context of misunderstanding or which included hesitations or word finding problems were defined as "verbally problematic". Utterances in smooth sequences, where no misunderstandings, hesitations or word finding problems could be noticed were defined as "verbally unproblematic". (Examples of verbally problematic utterances are given in Appendix 1.) For each utterance the occurrence or non-occurrence of NVC was noted. Comparisons were made between the occurrence of NVC in

a) verbally problematic utterances and verbally unproblematic utterances,
b) utterances made by aphasics and utterances made by therapists.

A statistical analysis of the results was made using the Mann-Whitney U-test.

4.4. Part 2 - Qualitative analysis

A qualitative analysis of all instances of NVC used by aphasics and therapists in the conversations was made. Each occurrence of NVC was described in terms of type or function and the resulting data were used for comparisons among types of NVC used by aphasics and therapists and among types of NVC used by different types of aphasics. The occurrences of NVC were referred to a few broad type or function categories, by choice of main type/types or function/functions by two independent judges.

An analysis of types or functions of NVC used in situations with verbally problematic utterances (see Part 1) was also made.

A short test of NVC was given to each aphasic, where the patient was asked to produce six illustrators, six emblems and six facial expressions for feelings. (See Appendix 2.) Normal controls performed 100% correctly on this test. The results were compared to the use of NVC in conversation for each patient. The test was given by the therapists after the conversation and it was videorecorded.

5. RESULTS

5.1. Part 1 - Quantitative analysis

The occurrence of NVC with verbally problematic utterances versus verbally unproblematic utterances in patients and therapists is shown in table 1.

Table 1 .

PATIENTS number of utterances with NVC (out of 6 possible)			THERAPISTS number of utterances with NVC (out of 6 possible)		
	verbal problems	no verbal problems		verbal problems	no verbal problems
P1	6	3	T1	5	0
P2	6	4	T2	3	1
P3	4	0	T3	4	3
P4	4	1	T4	3	3
P5	5	4	T5	4	1

The hypothesis that patients would use more NVC in situations where verbal communication was problematic than in verbally unproblematic situations was tested using the Mann-Whitney U-test.

Three additional hypotheses were also tested using the same method:

a) that therapists would also use more NVC in verbally problematic situations

b) that patients would use more NVC than therapists in verbally problematic situations and

c) that patients would also use more NVC than therapists in unproblematic situations.

The U-values for the different hypotheses are shown in table 2.

Table 2.

Patients	verbal problems-no verbal problems	U = 0
Therapists	verbal problems-no verbal problems	U = 0
Verbal problems	patients-therapists	U = 2
No verbal problems	patients-therapists	U = 6

The differences between verbally problematic and verbally unproblematic utterances were significant for both groups at 0.05 level, i.e. patients and therapists used more NVC in verbally problematic than in verbally unproblematic situations.

The use of NVC with verbally problematic utterances was significantly higher for patients than for therapists, also at 0.05 level.

There was a slight, though not significant, similar type of difference between the two groups in verbally unproblematic situations.

To sum up the results of part 1, the main hypothesis and additional hypotheses a) and b) above were confirmed, while there was a non-significant tendency supportive of hypothesis c).

5.2. Part 2 - Qualitative analysis

Each entire ten minute conversation was used for this analysis. The results are shown in table 3 below.

The functions of NVC that were typically found, and to which practically all occurrences of NVC could be referred, when adapators that had no obvious function in the communication were disregarded, were the following:

A. ILLUSTRATION, all NVC that shows the content of ideas or propositions, accompanying or replacing speech (e.g. showing with hand movements "knitting", "writing" etc.)

B. EMPHASIS, shown by so called "batons", i.e. forward and downward movements of one hand or head nods, accompanying stressed words.

C. FEEDBACK/AFFIRMATION, shown by nodding or shaking one's head, depending on what kind of utterance is being affirmed (cf. Fretheim 1983). Usually it is the conversation partner's utterance that is being affirmed, but aphasics sometimes affirm their own utterances.

D. NEGATION, here used only for head-shakings that are not cases of ordinary feedback, i.e. for denials of utterances made by either of the conversation

partners. (Subsequent negation of one's own utterance is also often found In aphasics.)

E. QUESTION, usually marked by a vague hand-movement from the therapist towards the aphasic.

F. HESITATION/SEARCHING FOR WORDS, typically shown by raising one hand and waving it forward from ones mouth. Adaptors which are repeated with word finding problems are also counted here.

G. APPEAL, usually consisting of the patient's pointing to the therapist and nodding.

H. SIGNS OF GIVING UP, are, for example, shrugging one's shoulders, turning away and looking to one side, looking at the floor or putting one's head in one's hand and looking blankly in front of oneself. Sometimes this is accompanied by a vague head-shaking.

Table 3. Functions/types of NVC in conversations.

CONVERSATION	1	2	3	4	5	
Patient	1	2	3	4	5	TOTAL
type/function of NVC						
illustration	20	42	22	16	22	122
emphasis	10	26	13	10	5	64
feedback. affirmation	20	44	23	11	24	122
negation	4	24	11	4	13	56
question	0	0	0	0	0	0
hesitation searching for words	21	23	15	19	8	85
appeal	1	1	2	0	16	20
sign of giving up	0	9	4	0	5	18
TOTAL	76	169	90	59	93	

Therapist	1	2	3	4	5	TOTAL
type/function of NVC						
illustration	0	25	23	5	7	60
emphasis	9	7	9	10	8	43
feedback affirmation	12	15	13	26	20	86
negation	0	0	0	0	0	0
question	0	3	4	0	4	11
hesitation searching for words	2	0	3	0	0	5
appeal	0	0	0	0	0	0
sign of giving up	0	0	0	0	0	0
TOTAL	23	50	52	41	39	

A comparison between fluent and non-fluent aphasics showed that fluent patients used less NVC than non-fluent patients and that this difference is attributable to the fact that the fluent patients (patients 1 and 4) did not use NVC to show that they gave up and only seldom used NVC to negate their own utterances. Approximately the same amount of NVC for hesitation/searching for words, illustration and feedback/affirmation was used by the two groups. NVC used for appeal was found mainly in patient 5 (non-fluent).

The therapists used NVC mainly for feedback/affirmation and emphasis. There were some occurrences of NVC for hesitation/ searching for words and question. There was a considerable individual variation between therapists in the use of NVC for illustration.

The typical sequences found in situations where the aphasics had verbal problems were the following:

A. The patient has the turn, makes a pause and gives a nonverbal signal "meaning".

a) wait, I am searching for words (hesitation/search. for words)

b) interpret my nonverbal behaviour (illustration)

c) fill in for me (appeal)

d) take the turn, I give up (sign of giving up)

e) disregard what I just said, it was wrong (negation)

B. The therapist answers:

a) waits
b) guesses the word or asks clarifying question
c) -.-
d) - accepts and starts on a new topic
- or does not accept and answers according to a, b or c above
e) asks a clarifying question

These nonverbal signals are usually not accompanied by speech. Verbal complements or alternatives are sometimes used, for example "what's it called" for hesitation/searching for words, ¨yes¨ with a rising intonation for appeal and "no" or "I can't" for negation or sign of giving up.

The result of the NVC test is given in table 4. (The test is given in Appendix 2.)

Table 4.

Patient	1	2	3	4	5
Number of correct responses (out of 6 possible for each type)					
ILLUSTRATORS	6	2-4?	6	6	6
EMBLEMS	5	1	6	6	0
FACIAL EXPRESSIONS FOR EMOTIONS	6	4	6	6	3

Patients 2 and 5, both non-fluent and with severe aphasia, had problems in this tests, whereas the other three aphasics found it quite easy. Patient 2 made typically apractic errors (apraxia = inability to perform volitional movements) and patient 5 was hampered by perseveration (i.e. difficulties in changing to a new movement). These two patients were those that used the largest amount of spontaneous NVC in the conversations.

6. CONCLUSIONS

The main questions of this study can be answered in the following way.

Question 1: Is NVC generally used more in situations where speech is problematic than in other situations? and Question 2: Is NVC used more by aphasics than by normal speakers?

NVC was used more in verbally problematic situations. That this was found in therapists as well as aphasics implies that it is a general communicative strategy. Aphasics, however, used more NVC than did therapists in both verbally problematic and verbally unproblematic situations. These findings were statistically significant. They suggest that some kind of "compensatory" NVC is used when a person finds himself in verbal difficulties of a temporary or lasting nature.

Question 3: What types or functions of NVC are found in aphasics of different types a) generally, b) in situations with verbal problems?

Among the aphasics in the study the non-fluent patients used more NVC than the fluent patients. The amount of illustrative NVC, which is especially interesting as a possible tool for compensation, was about the same in fluent and non-fluent aphasics (although patient 2 used an extremely large number of illustrative gestures). Illustrative NVC replacing speech occurred in all patients. The amount of hesitation/searching for words and feedback/affirmation was also similar from patient to patient. Nothing that could be interpreted as a lack of ability to use NVC spontaneously could be found In any of these patients. The fact that the non-fluent

aphasics used more NVC for functions such as showing that they gave up, appealing to the therapist and negating their own utterance or the therapist's guess of what they intended to say seems to be caused simply by a need to use NVC for these functions, since verbal expressions are not as easily accessible to these patients.

Question 4: How is the ability of aphasics to use NVC in conversation related to their ability to use *NVC* In a test situation?

There seems to be no obvious correspondence between performance on the *NVC* test used here and the spontaneous use of *NVC* in conversation. Patients 2 and 5, who had some problems in the test, used the largest amount of NVC in spoken interaction. Their NVC was usually correctly used and it covered a wide range of types or functions. This finding is important in that it stresses the difference between spontaneous use of *NVC* and ability to use nonverbal signs in tests and In specific therapy aiming at teaching the aphasic to use special signs deliberately for special words. The degree of communicative awareness might be an important factor here. A possible interpretation is that stimulation of spontaneous use of NVC ought to be a more fruitful method than training of specific signs.

Question 5: Is NVC used as compensation for verbal communication by aphasics of different types?

The data in this study strongly suggest that aphasics of different types spontaneously use NVC for compensation and substitution when they have verbal difficulties. (See "typical sequences" p. 13.) The content of the observed NVC used by the aphasics in the conversations mostly belongs to the category "structuring and supplementing information". Illustration, emphasis and negation are mainly of this type. NVC as "regulating communication" also occurs frequently (i.e. hesitation/searching for words, feedback/affirmation, appeal and sign of giving up). "Information about feelings and attitudes" is conveyed mainly in NVC as hesitation/searching for words. The content categories are, of course, not mutually exclusive, and one occurrence of NVC might very well belong to more than one of them. For example, someone might show by shaking his head that he gives up, negates what he just said and feels hesitant. As for the interpretation of NVC content in terms of compensation for verbal communication, the large amount of NVC used for "structuring and supplementing information" and "regulating communication" can be said to show that NVC is normally frequently used with these contents and/or that NVC replaces part of the verbal communication of these contents in aphasics. The fact that the aphasics used NVC significantly more than the therapists suggests that the second alternative should be seriously considered. Some general conclusions are that, on the basis of this study one can assume a) that nonverbal communication is used as a complement to or replacement of verbal communication when it is needed, b) that this happens spontaneously both in both aphasics and non-aphasics and c) that this ability does not seem to be disturbed in any of the aphasics in the study.

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Appendix 1

Aphasia types

(defined according to ability to perform linguistic tasks,

Reinvang & Engvik, 1980)

	Naming	Repetition	Speech production (fluent)	Speech comprehension
Broca's aphasic	-	-	-	+
Wernicke's aphasic	-	-	+	-
Conduction aphasic	-	-	+	+
Anomic aphasic	-	+	+	+

(This is a rough description and there is considerable individual variation.)

Appendix 2

Test - Production of nonverbal communication

Show me with gestures and facial expressions, without using words:

a) round
big
to drink
to drive
house
tree

b) Come here!
I don't know.
You mustn't.
You are stupid!
Look there!
Ugh, take it away!

c) happy
sad
angry
afraid
surprised
disgusted

Appendix 3

Examples of utterances a) with verbal problems, b) with no verbal problems:

(// indicates a pause, P = patient, T = therapist)

a)
(T: va e de första du minns när du vaknade upp)

P: // ja kommer inte ihåg nu nää ja kommer inte ja har glömt elle ja ha må sen jaa visst // de va ju när ja hade opererat sej mej

(T: ja va du på avdelningen uppe då)

b)

(P: nää nä hon visste ju inte att jag för hon börja på på va hette de s e m ja va hette de de e jobbit)

T: hon va blev hon permitterad också

(P: nää nä nä e hon va på konto hon va i affären ja va ju på kontoret)

Translation:

a)
(T: what is the first thing you remember when you woke up)

P: // I don't remember now noo I don't I have forgotten or I have also then yes* of course // that was when they had operated on them me

(T: yes were you in the ward up there then)

b)

(P: noo no she didn't know that 1 because she started on on // what's it called s e m yes what's It called it it is hard)

T: she did was she also laid off

(P: noo no no eh she was in the offi she was in the store I was in the office)